

REMARKS

Rejections under 35 U.S.C. 103

Claims 1-3, 5-10, 12-15 and 17-20 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,204,130 to Gardner in view of the admitted prior art, and claims 4, 11 and 16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner in view of the admitted prior art, and further in view of U.S. Patent No. 5,977,589 to Schloesser. Applicants respectfully disagree.

Claim 1

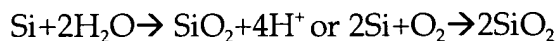
In section 2 of the Action, the Examiner asserts that Gardner teaches treating a silicon layer using a gas comprising oxygen and an etching agent, and in particular "forming an oxide layer (claimed etching buffer layer) by oxygen treatment and H₂O (claimed etching agent) (col. 4, lines 34-43)".

Applicants strongly disagree, and respectfully submit that, as evidenced by the enclosed Affidavit under 37 C.F.R. 1.132 by Dr. Paul Yih, a specialist in the field of semiconductor process, the following remarks can be made about the Examiner's assertions:

-Applicants note that col. 4, lines 34-43 of Gardner recites "*The polysilicon block 209 is oxidized in an oxygen bearing ambient (e.g., O₂ and or H₂O). The oxidation generally forms an oxide layer 211 on exposed surfaces of the polysilicon block 209 by consuming a portion of the polysilicon block 209. The resultant structure is depicted in Fig. 2E. The oxidation of the polysilicon block 209 may be performed using a number of different known oxidation techniques including, for example, thermal oxidation. As will be discussed below, the remaining portion 210 of the polysilicon block 209 is used as a gate electrode*".

Applicants note in particular that the recitation that the "*polysilicon block 209 is oxidized in an oxygen bearing ambient (e.g., O₂ and or H₂O)*" explicitly means that the gas

existing in the "oxygen bearing ambient" functions as an oxidant reacting with the polysilicon block 209 according to one of the following chemical formulae.



Applicants note that the above excerpt describes clearly and unambiguously that O_2 and H_2O are used as an "oxygen bearing ambient" for forming the oxide layer 211 by oxidizing the polysilicon block. It does not disclose that any of O_2 and H_2O is used as an etching agent.

-Applicants note that H_2O is typically used in the field of semiconductor process as a solvent or as a source for providing O or H atoms but has no known use as an "etching agent" in the field of semiconductor process, and that Gardner does consistently nowhere hint that H_2O can be considered as an "etching agent" for the polysilicon block.

-Applicants further note that Gardner teaches using etching agents, or etchants, such as "plasma-chemistry etchants and wet etchants" (col. 5, line 9) and specifically suggests using "hydrofluoric acid" (col. 5, line 11) for removing oxide layer 211, but not for forming it.

Applicants therefore respectfully submit that the Examiner has altogether failed to show that Gardner discloses or suggests a process as recited in claim 1, and in particular comprising *"treating said patterned silicon layer with etching residues on sidewalls thereof using a gas comprising oxygen and etching agent to thereby form an etching buffer layer conformally on the etching residues and the top surface of the patterned silicon layer"*.

Applicants respectfully submit that the Examiner has also failed to show that the admitted prior art discloses or suggests using a gas such as recited in claim 1 for forming a buffer layer on the etching residues. Accordingly, Applicants respectfully submit that the Examiner has failed to show that any combination of Gardner and the admitted prior art would have led one of ordinary skill in the art to a process as recited in claim 1, and in particular comprising *"treating said patterned silicon layer with etching*

residues on sidewalls thereof using a gas comprising oxygen and etching agent", and submit that claim 1 is patentable over Gardner in view of the admitted prior art.

Claims 7 and 14

Applicants respectfully submit that the above arguments can be used to show that Gardner, as well as the admitted prior art, fails to disclose or suggest a method as recited in claim 7, and in particular comprising *"treating said patterned silicon layer with patterns and etching residues on sidewalls thereof using a gas comprising oxygen and etching agent to thereby form an etching buffer layer conformally on the etching residues and the top surface of the patterned silicon layer"*, or a method as recited in claim 14, and in particular comprising *"introducing a gas containing oxygen treatment, using a gas comprising oxygen and etching agent, to conformally form an etching buffer layer on the etching residues and the top surface of the patterned silicon layer"*. Accordingly, Applicants respectfully submit that claims 7 and 14 are patentable over Gardner in view of the admitted prior art.

Claims 2-3, 5-6, 8-10, 12-13, 15 and 17-20

Claims 2-3 and 5-6 depend directly or indirectly on claim 1; claims 8-10 and 12-13 depend directly or indirectly on claim 7, and claims 15, and 17-20 depend directly on claim 14. Applicants respectfully submit that at least in view of their dependency on claims 1, 7 or 14, claims 2-3, 5-6, 8-10, 12-13, 15 and 17-20 are patentable over Gardner in view of the admitted prior art.

Claims 4, 11 and 16

Claim 4 depends on claim 1, claim 11 depends on claim 7, and claim 16 depends on claim 14. Applicants respectfully submit that the Examiner has failed to show that Schloesser discloses or suggests a method as recited in claim 1, and in particular comprising *"treating said patterned silicon layer with etching residues on sidewalls thereof using a gas comprising oxygen and etching agent to thereby form an etching buffer layer conformally on the etching residues and the top surface of the patterned silicon layer"*, as recited in claim 7, and in particular comprising *"treating said patterned silicon layer with patterns*

and etching residues on sidewalls thereof using a gas comprising oxygen and etching agent to thereby form an etching buffer layer conformally on the etching residues and the top surface of the patterned silicon layer", or a method as recited in claim 14, and in particular comprising *"introducing a gas containing oxygen treatment, using a gas comprising oxygen and etching agent, to conformally form an etching buffer layer on the etching residues and the top surface of the patterned silicon layer"*. Accordingly, in view of the above, Applicants submit that the Examiner has failed to show that a combination of Gardner, the admitted prior art and Schloesser would have led one skilled in the art to a method as recited in claims 1, 7 or 14. Applicants therefore respectfully submit that claims 1, 7 and 14 are patentable over Gardner in view of Schloesser, and that at least in view of their dependency on claims 1, 7 or 14, claims 4, 11 and 16 are patentable over Gardner in view of the admitted prior art and further in view of Schloesser.

* * *

In view of the above, Applicants submit that the application is now in condition for allowance and respectfully urge the Examiner to pass this case to issue.

The Commissioner is authorized to charge any additional fees that may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136(a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.

I hereby certify that this correspondence is being deposited with the United States Post Office with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on

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(Date of Transmission)

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(Name of Person Transmitting)

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Respectfully submitted,



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Attachments: Applicant's Affidavit under 37 C.F.R. 1.132
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